Docket No.: E-41409

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By: ______________________ Date: December 19, 2003

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Before the Board of Patent Appeals and Interferences

Applicant : Ludwig Wieres   Confirmation No. 7087

Applic. No. : 09/992,285

Filed : November 19, 2001

Title : Honeycomb Body, in Particular Catalyst Carrier Body, for Motorcycle or Diesel Applications

Examiner : Jonas N. Strickland   Art Unit: 1754

Docket No. : E-41409

Customer No. : 24131

SUPPLEMENTAL APPEAL BRIEF AND REQUEST FOR REINSTATEMENT OF APPEAL

Hon. Commissioner for Patents,
P.O. Box 1450
Alexandria, VA 22313-1450

S i r :

In response to the Office action reopening prosecution dated September 30, 2003, reinstatement of the appeal is hereby requested and a supplemental appeal brief is submitted herewith.

Real Party in Interest:

This application is assigned to Emitec Gesellschaft für Emissionstechnologie mbH of Lohmar, Germany. The assignment will be submitted for recordation upon the termination of this appeal.

Related Appeals and Interferences:

No related appeals or interference proceedings are currently pending which would directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

Status of Claims:

Claims 1, 4, 6, 10, 13, 16 and 19 are under appeal.

Status of Amendments:

No claims were amended after the final Office action. *An amendment under 37 CFR § 1.116* was submitted on May 20, 2003 together with a *Notice of Appeal.*

Summary of the Invention:

As stated in the first paragraph on page 1 of the specification of the instant application, the invention relates to a honeycomb body which is produced from layered or wound sheet-metal layers, as is used in particular as a catalyst carrier body for exhaust gas-cleaning systems. Such

honeycomb bodies are typically produced from alternating layers of smooth and corrugated sheets or from alternating layers of differently structured metal sheets, by winding or layering. Honeycomb bodies of that type are described, for example, in International Publication No. WO 94/13939, corresponding to U.S. Patent Nos. 5,729,902 and 5,618,501.

Appellant explained on page 9 of the specification, line 25, that, referring now in detail to the single figure of the drawing, there is seen a honeycomb body 1, which is produced from smooth sheet-metal layers 2 and corrugated sheet-metal layers 3 and is situated inside a tubular jacket 5. The sheet-metal layers 2, 3 are formed of metal sheets having a thickness d of from 0.08 to 0.12 mm. The sheet-metal layers 2, 3 form passages 4 through which exhaust gas can flow and which are preferably of such a size that the honeycomb body has between 200 and 600 cpsi. The sheet-metal layers are formed of a stainless steel containing 15 to 25 percent by weight of chromium, preferably 18 to 22%, typical levels of certain rare earths which are known to increase the resistance to corrosion and an aluminum content of 1 to 4.5%, in particular 2 to 4%.

Appellant further explained on page 10 of the specification, line 13, that the present invention allows particularly

inexpensive production of catalyst carrier bodies for exhaust-cleaning systems of motorcycles or diesel vehicles, the quality of which is adapted to the surrounding conditions.

References Cited:

U.S. Patent No. 4,414,023 (Aggen et al.), dated November 8, 1983;

U.S. Patent No. 5,422,083 (Sheller), dated June 6, 1995;

Published European Patent Application No. 0 497 992 A1 (Sato et al.), dated August 12, 1992;

U.S. Patent No. 5,055,145 (Ikegami et al.), dated October 8, 1991.

Issues

1. Whether or not claims 1, 4, 6, 10, 13, and 19 are obvious over Sheller in view of Aggen et al. and Ikegami et al. under 35 U.S.C. §103(a).
2. Whether or not claim 16 is obvious over Sheller in view of Aggen et al. and Ikegami et al. and further in view of Sato et al. under 35 U.S.C. §103(a).

Grouping of Claims:

Claims 1 and 19 are independent. Claims 4, 6, 10, 13, and 16 depend on claim 1. The patentability of claims 4, 6, 10, 13,

and 16 are not separately argued. Therefore, claims 4, 6, 10, 13, and 16 stand or fall with claim 1.

Arguments:

In item 5 on pages 3-5 of the above-mentioned Office action, claims 1, 4, 6, 10, 13, and 19 have been rejected as being unpatentable over Sheller in view of Aggen et al. and Ikegami et al. under 35 U.S.C. § 103(a).

Before discussing the prior art in detail, it is believed that a brief review of the invention as claimed, would be helpful.

Claims 1 and 19 call for, inter alia:

> layered or wound sheet-metal layers at least partially structured to form passages through which exhaust gas can flow, said sheet-metal layers formed of a stainless steel, having a thickness of more than 0.08 mm and <u>having an aluminum content in percent by weight of between 6 and 12% multiplied by 0.02 mm divided by said thickness of said sheet-metal layers</u>. (Emphasis added).

As already discussed in the Brief on Appeal filed July 7, 2003, according to claims 1 and 19 of the instant application, the aluminum content of the sheet metal layers used to form the honeycomb body is between 6 and 12 percent multiplied by 0.02 millimeters divided by the thickness of the sheet metal layers. This teaches one skilled in the art precisely how large the aluminum content of the sheet metal layer has to be. The aluminum content is dependent on the thickness of the

layers being used. This is advantageous for thick sheet metal layers of more than 0.08 millimeters thickness. The advantage of such a honeycomb body is that the sheet metal layers used for the production of a honeycomb body can be produced precisely and at particularly low costs (see page 3, line 25 to page 4, line 4 of the specification of the instant application).

Sheller discloses a reinforced catalytic converter made of two types of thin metal strips: corrugated thin metal strips and flat thin metal strips (see column 4, lines 36-51). The basic idea of Sheller is to reinforce the catalytic converter by forming a part of the flat metal sheets from an alloy having improved strength properties as compared to the alloy from which the remaining layers are formed, whereas all layers have preferably the same thickness (see column 4, lines 62-65).

Sheller discloses a thickness of the sheet metal layers in the range of 0.001 to 0.009 inches (see column 4, lines 36 to 48). Sheller also discloses that the flat metal layers may be made of Haynes 214 or Haynes 230 alloy (see column 4, lines 39-41). Haynes 230 alloy is a nickel-based alloy that contains no aluminum (see column 2, lines 2-6). A nickel based Haynes 214 alloy is described in a specific example in column 2, lines 63 to 67 of Sheller as containing 75 % nickel, 16 % chromium, 4.5

% aluminum, 3 % iron, optionally trace amounts of one or more rare earth metals, except yttrium, 0.05 carbon, and trace amounts of steel making impurities.

In summary, Sheller teaches to manufacture a honeycomb body wherein:

- the corrugated metal layers are made of ferritic stainless steel such as , e.g., Alpha IV,
- the flat metal layers are composed of a nickel based alloy having an aluminum content of 4.5 %, and
- all layers have a thickness in the range of 0.001 inches (0.00254 cm) to 0.009 inches (0.02286 cm).

This means that for all thicknesses of thin metal strips disclosed by Sheller the composition is the same. Therefore, Sheller does not teach the change of aluminum content depending on the thickness of the sheet metal layer, as recited in claims 1 and 19 of the instant application.

Aggen et al. disclose a ferritic stainless steel alloy which contains 3 to 8 % aluminum (see column 3, lines 14-30). Aggen et al. further disclose that the aluminum content is variable depending on the chromium content. Aggen et al. discloses the following formula:

$$\%AL = (40 - \%Cr) / 6.$$

This means that one skilled in the art is taught by Aggen et al. that it is advantageous to specify the aluminum content in dependence on the chromium content. Aggen et al. disclose foils of 0.002 inches (0.005 cm) thickness (see column 8, lines 39 to 41). However, Aggen et al. do not disclose foils of varying thickness. The only foil thickness disclosed by Aggen et al. is the foil thickness of 0.002 inches (0.005 cm) as disclosed in column 8, lines 39 to 41.

Therefore, Aggen et al. do not disclose any dependence of the aluminum content on the thickness of the foil as recited in claims 1 and 19 of the instant application.

The newly cited reference Ikegami et al. discloses no features which are not disclosed by Aggen et al.

Ikegami et al. disclose a process for the production of ferrite stainless steel foils for use in catalyst supports in the exhaust gas system of automobiles (see column 1, lines 10-16). Ikegami et al. clearly disclose that only foils with an aluminum content of 3 percent and more are suitable for use in catalyst supports (see column 3, lines 34-39) as only then the foils can withstand prolonged oxidation at 800-950°C.

In contrast, claims 1 and 19 of the instant application recite an aluminum content of less than 3 percent by weight. Claims 1 and 19 of the instant application both claim that the thickness of the layers is 0.08mm and more and that the aluminum content in percent by weight is between 6 to 12% multiplied by 0.02mm divided by the thickness of the sheet-metal layers:

$$Al\% = \frac{(6 to 12).0.02mmm}{thickness}\%$$

Since the thickness is 0.08mm and more, the minimum aluminum content computes to be 1.5 to 3% for foils having a thickness of 0.08mm. This aluminum content is lower for any foil with a thickness of more than 0.08mm. Consequently, the maximum aluminum content claimed in claims 1 and 19 of the instant application is 3%.

This kind of aluminum content is clearly not disclosed by Ikegami et al. In contrast, it is clearly disclosed by Ikegami et al. that foils with an aluminum content as low as those claimed in claims 1 and 19 of the instant application cannot withstand the conditions in an exhaust gas system of an automobile ("...when an aluminum layered foil is to be used for catalyst supports in automobile's exhaust gas converters, the total amount of aluminum has to be adjusted to <u>3 percent and above</u> in the foil ... so that the foil can withstand

prolonged oxidation at 800°-950° C," see column 3, lines 34-39 of Ikegami et al., emphasis added).

Therefore, one skilled in the art would not combine Ikegami et al. with Sheller because otherwise he or she would have to leave the concept of Ikegami et al. in order to reach the teaching of claims 1 and 19 of the instant application. One skilled in the art would not lower the aluminum content disclosed by Ikegami et al. as this would, according to the disclosure of Ikegami et al., result in foils that would not withstand the conditions in an exhaust gas system.

Furthermore, even if one skilled in the art would combine the teaching of Ikegami et al. with the teaching of Sheller, he or she would not reach the teaching of claims 1 and 19 of the instant application, which are directed to foils having an aluminum content depending on the thickness of the foils. This means that at the beginning of the production process the final thickness of the foil has to be known. This is neither the case in Sheller nor in Ikegami et al.

The examiner has referred to column 3, lines 31-43 of Ikegami et al. in the Office action and has stated that "the thickness of aluminum layer to be put on stainless steel is naturally different from case to case with the thickness and the

aluminum content of ferrite stainless steel foils" (see the third paragraph on page 4 of the Office action). The aluminum layer on the ferrite stainless steel foil is used for increasing the aluminum content of the ferrite stainless steel foil (see column 2, lines 42 to 49). Based on a given basic aluminum content in the stainless steel foil, the amount of aluminum needed for increasing the overall aluminum content above 3 percent (see column 3, lines 33 to 39) is of course dependent on the thickness of the stainless steel foil, since the thickness of the stainless steel foil contributes to the weight of stainless steel foil, the aluminum content of which has to be increased. This means that the thicker the foil of a given aluminum content, the more aluminum is needed to increase the aluminum content above 3 percent. The thicker the aluminum layer, the more aluminum can contribute to increase the overall aluminum content of the foil. Consequently, the thickness of the aluminum layer and thus the amount of aluminum contributing to the increase has to depend on the thickness of the foil and the aluminum content of the stainless steel foil before the increase.

However, this is something completely different than the subject matter of the invention of the instant application where the overall aluminum content depends on the thickness of the foil. In addition, the aluminum content in Ikegami et al.

is clearly raised above 3 percent, whereas the aluminum content according to the invention of the instant application is 3 percent and less.

It is accordingly believed to be clear that none of the references, whether taken alone or in any combination, either show or suggest the features of claims 1 or 19. Claims 1 and 19 are, therefore, believed to be patentable over the art and since claims 4, 6, 10, and 13 are dependent on claim 1, they are believed to be patentable as well.

In item 6 on pages 5-6 of the above-mentioned Office action, claim 16 has been rejected as being unpatentable over Sheller in view of Aggen et al. and Ikegami et al. and further in view of Sato et al. under 35 U.S.C. § 103(a).

As discussed above, claim 1 is believed to be patentable over the art. Since claims 16 is dependent on claim 1, it is believed to be patentable as well.

The honorable Board is therefore respectfully urged to reverse the rejection of the Primary Examiner.

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Respectfully submitted,

For Appellant

YC

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Appendix - Appealed Claims:

1. A honeycomb catalyst carrier body for exhaust gas-cleaning systems of motorcycles, comprising:

layered or wound sheet-metal layers at least partially structured to form passages through which exhaust gas can flow, said sheet-metal layers formed of a stainless steel, having a thickness of more than 0.08 mm and having an aluminum content in percent by weight of between 6 and 12% multiplied by 0.02 mm divided by said thickness of said sheet-metal layers.

4. The honeycomb body according to claim 1, wherein said thickness of said sheet-metal layers is from 0.08 to 0.12 mm.

6. The honeycomb body according to claim 1, wherein said passages number between 200 and 600 cpsi (cells per square inch).

10. The honeycomb body according to claim 1, wherein said aluminum has a content of 2 to 4%.

13. The honeycomb body according to claim 1, wherein said sheet-metal layers are rolled.

16. The honeycomb body according to claim 1, wherein said sheet-metal layers are rolled and removed from a production process for producing hot-dip aluminized material before an aluminum content is raised.

19. A honeycomb body, comprising:

layered or wound sheet-metal layers at least partially structured to form passages through which exhaust gas can flow, said sheet-metal layers formed of a stainless steel, having a thickness of more than 0.08 mm and having an aluminum content in percent by weight of between 6 and 12% multiplied by 0.02 mm divided by said thickness of said sheet-metal layers.